

# Project 2

CSE 473/573 (Spring 2019)

Due Date: April 5th, 11:59 pm

## 1 Image Stitching [100 points + 15 bonus points]

The goal of this task is to experiment with image stitching methods. Given a set of photos, your program should be able to stitch them into a panoramic photo (as shown in Figure 1). There are no restrictions regarding the method you use to stitch photos into a panoramic photo.

Please keep in mind that the best solution may require transformation of some of the images in 3D, not just a simple overlap and blending.

For this project, you can assume you will have at most 3 images that you need to stitch together and that the overlap of any two will be at least 20%. You will have to determine the spatial arrangement of the images automatically.

While some of the most modern techniques may use a spherical projection of better panoramas, you are free to assume that basic 2D Planer transformations are sufficient.

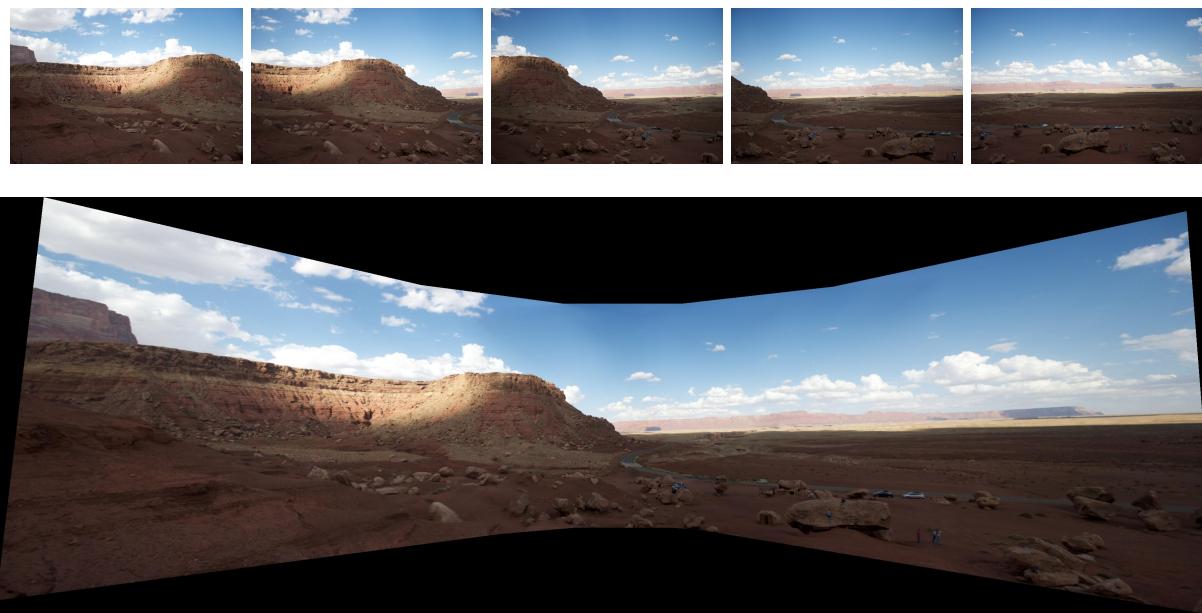


Figure 1: Top: photos used to create the panoramic photo on the bottom row. Bottom: panoramic photo created using the 5 photos on the top row.

### 1.1 Bonus

To get the 15 bonus points, you can take 3 photos that demonstrate something of value to you about UB life. This could be at an event, something on campus, a road trip, etc, but have something UB related in the scene. You must then take your program and stitch them into a panoramic photo. The overlapped region between any 2 of the photos you take should not exceed 50%.

### 1.2 Requirements

Your submission should meet the following requirements:

- The code and photos are stored in a single file whose extension is “zip”.
- The code you provide should be stored in a folder named “src”

- The photos you take for the bonus named “ub1.jpg”, “ub2.jpg” and “ub3.jpg” and should be stored in a folder named “ubdata”.
- After changing the working directory into the folder that contains your code, the grader should be able to run your program to stitch the photos in either of the datasets using the command “`python stitch.py [datadirectory]`”.
- The program should read ALL jpg files in the data directory and stitch them together.
- The panoramic photo your program creates should be saved to the same directory as the data and be called “panorama.jpg”

### 1.3 Python Library

- Any Python Standard Library could be used.
- Any API provided by Numpy or Scipy could be used.
- Any API provided by OpenCV could be used, except “`cv2.findHomography()`” and APIs that have “stitch”, “Stitch”, “match” or “Match” in their names, e.g., “`cv2.BFMatcher()`” and “`cv2.Stitcher.create()`”.
- If you decide to use SIFT, please note it has been patented and it has been removed from OpenCV3, but it is included in OpenCV2.

`cv2.findHomography( )` → Not allowed